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IS 4813 (1980): Chemically-bonded chrome-magnesite refractories for general purposes [MTD 15: Refractories]



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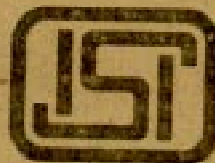
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*Indian Standard*  
SPECIFICATION FOR  
CHEMICALLY-BONDED CHROME-MAGNESITE  
REFRACTORIES FOR GENERAL PURPOSES  
( *First Revision* )

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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

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February 1981

*Indian Standard*  
**SPECIFICATION FOR**  
**CHEMICALLY-BONDED CHROME-MAGNESITE**  
**REFRACTORIES FOR GENERAL PURPOSES**  
*( First Revision )*

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*Indian Standard*  
SPECIFICATION FOR  
CHEMICALLY-BONDED CHROME-MAGNESITE  
REFRACTORIES FOR GENERAL PURPOSES  
( *First Revision* )

**0. FOREWORD**

**0.1** This Indian Standard ( First Revision ) was adopted by the Indian Standards Institution on 21 October 1980, after the draft finalized by the Refractories Sectional Committee had been approved by the Structural and Metals Division Council.

**0.2** Chrome-magnesite refractories are made from a mixture of chrome ore and magnesite with predominating percentage of chrome ore. In chemically-bonded refractories mechanical strength is imparted by chemical binding agents instead of firing.

**0.3** This standard was first published in 1968, and has now been revised in the light of the experience gained since then. In this revision, the apparent porosity has been specified in green ( unfired ) state, rather than after firing.

**0.4** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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**1. SCOPE**

**1.1** This standard covers the requirements for chemically-bonded chrome-magnesite refractories for general purposes. It does not cover the requirements of chemically-bonded chrome-magnesite refractories to be used as roof lining in steel making furnaces, such as open-hearth furnaces.

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\*Rules for rounding off numerical values ( *revised* ).

## **2. SUPPLY OF MATERIAL**

**2.1** General requirements relating to the supply of chemically-bonded chrome-magnesite refractories shall be as laid down in IS : 1387-1967\*.

## **3. SAMPLING**

**3.1** Representative samples shall be drawn according to the scheme of sampling given in IS : 1528 ( Part VII )-1974†.

## **4. CHEMICAL COMPOSITION**

**4.1** The material shall comply with the following requirements:

	<i>Percent</i>
Chromium oxide ( $\text{Cr}_2\text{O}_3$ ), <i>Min</i>	18
Magnesium oxide ( $\text{MgO}$ ), <i>Min</i>	30

**NOTE** — Till a suitable Indian Standard is published for the methods of chemical analysis of chemically-bonded chrome-magnesite refractories, the determination of chemical constituents as specified above shall be done as agreed to between the purchaser and the manufacturer.

## **5. PHYSICAL TEST REQUIREMENTS**

**5.1** Chemically-bonded chrome-magnesite refractories, when tested in accordance with the test methods specified, shall conform to the requirements, given in Table 1.

## **6. TOLERANCE ON SIZE**

**6.1** Variations from specified dimensions, covering both warpage and shrinkage, shall be allowed to the extent of  $\pm 1$  percent or  $\pm 1$  mm whichever is greater.

## **7. MARKING**

**7.1** Each refractory brick or shape shall be clearly marked with the manufacturer's name or trade-mark.

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\*General requirements for the supply of metallurgical materials (*first revision*).

†Methods of sampling and physical tests for refractory materials: Part VII Methods of sampling and criteria for conformity (*first revision*).



TABLE 1 PHYSICAL TEST REQUIREMENTS

( Clause 5.1 )

SL No.	CHARACTERISTICS	REQUIREMENT	TEST METHOD REF TO PART OF IS : 1528-1974*
(1)	(2)	(3)	(4)
i)	Apparent porosity ( green state ), percent by volume, <i>Max</i>	16	Part VIII
ii)	Refractoriness under-load, ta°C, <i>Min</i>	1 550	Part II
iii)	Cold crushnig strength MPa, <i>Min</i>	40	Part IV
iv)	Re-heat linear change after heating at 1 600°C for 2 h, percent, <i>Max</i>	1.0	Part VI

NOTE — 1 MPa = 10 kgf/cm<sup>2</sup>.

\*Methods of sampling and physical tests for refractory materials:

Part VIII Determination of apparent porosity (*first revision*).Part II Determination of refractoriness under load (*first revision*).Part IV Determination of cold crushing strength (*first revision*).Part VI Determination of permanent change after reheating (*first revision*).**7.1.1** The brick or shape may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

# INTERNATIONAL SYSTEM OF UNITS ( SI UNITS )

## Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

## Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

## Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s <sup>2</sup>
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m <sup>2</sup>
Frequency	hertz	Hz	1 Hz = 1 c/s (s <sup>-1</sup> )
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m <sup>2</sup>

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